FIG. 1

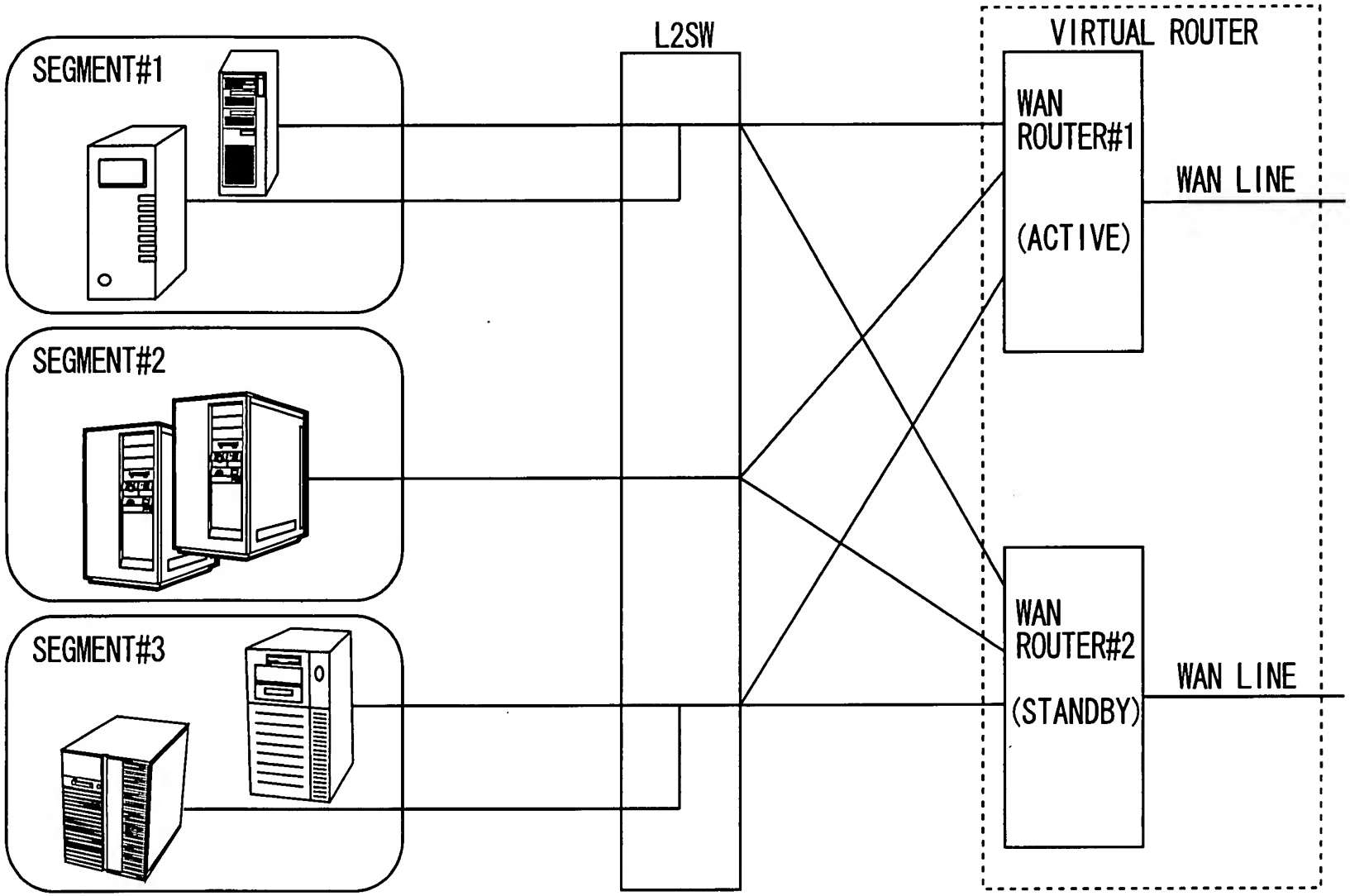
SEGMENT#1
SEGMENT#2
SEGMENT#3
L2SW
VIRTUAL ROUTER
WAN ROUTER#1
(ACTIVE)
WAN LINE
WAN ROUTER#2
(STANDBY)
WAN LINE

FIG. 2

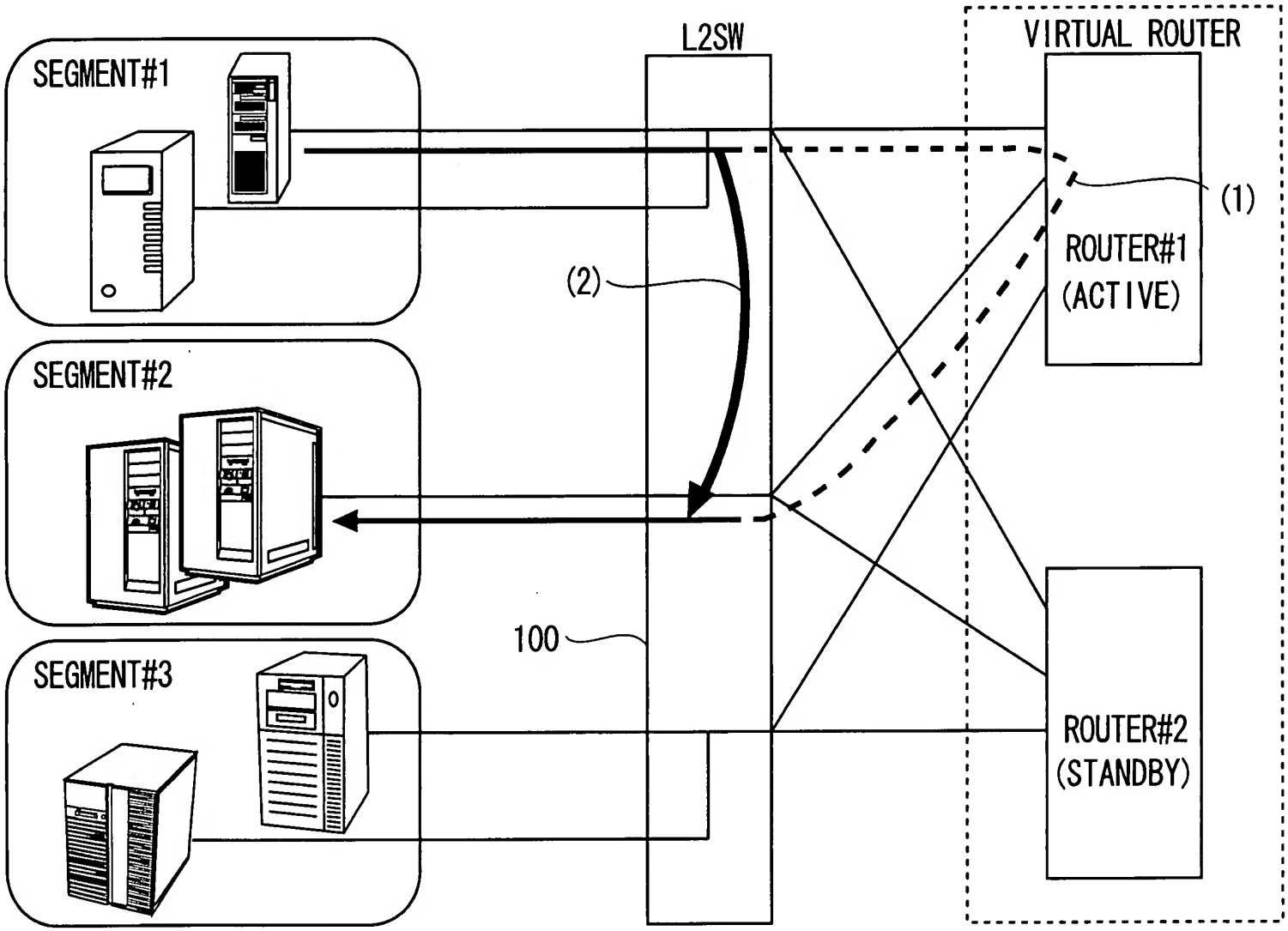
SEGMENT#1
SEGMENT#2
SEGMENT#3
L2SW
100
VIRTUAL ROUTER
ROUTER#1
(ACTIVE)
ROUTER#2
(STANDBY)
(1)
(2)

FIG. 3

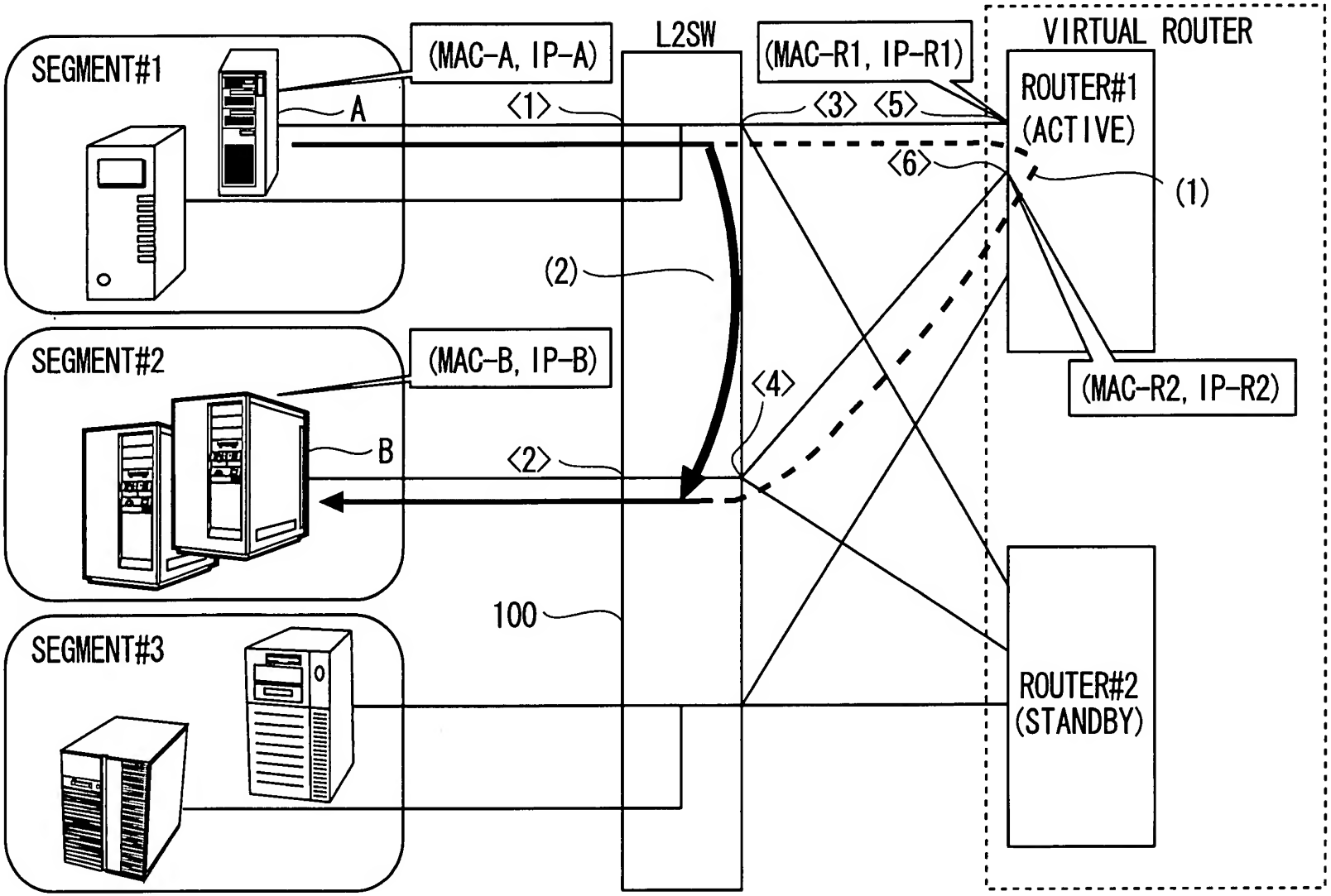
SEGMENT#1
A
(MAC-A, IP-A)
L2SW
(MAC-R1, IP-R1)
VIRTUAL ROUTER
ROUTER#1
(ACTIVE)
<1>
<3> <5>
<6>
(1)
(2)
SEGMENT#2
(MAC-B, IP-B)
<4>
(MAC-R2, IP-R2)
B
<2>
100
SEGMENT#3
ROUTER#2
(STANDBY)

FIG. 4

TABLE1:CHARACTERISTICS OF DATA BETWEEN SEGMENTS UNDER L2SW

	DIRECTION OF DATA	MAC ADDRESS		IP ADDRESS	
		SOURCE	DESTINATION	SOURCE	DESTINATION
A→B DIRECTION DATA	INPUT	MAC-A <1>	MAC-R1 <3>→<5>	IP-A	IP-B
	OUTPUT	MAC-R2 <4>←<6>	MAC-B <2>	IP-A	IP-B
B→A DIRECTION DATA	INPUT	MAC-B <2>	MAC-R2 <4>→<6>	IP-B	IP-A
	OUTPUT	MAC-R1 <3>←<5>	MAC-A <1>	IP-B	IP-A

FIG. 5

ADDRESS TABLE

8

PORT	MAC ADDRESS	IP ADDRESS	TIMESTAMP
1	MAC-A	IP-A	
2	MAC-B	IP-B	

FIG. 6

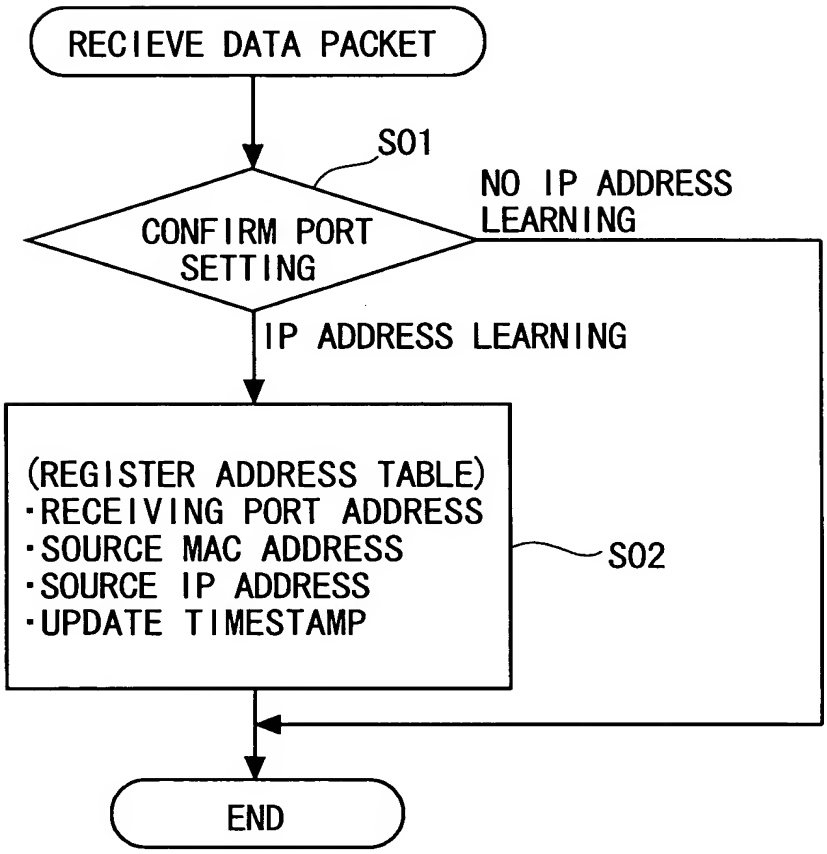
RECIEVE DATA PACKET
S01
CONFIRM PORT SETTING
NO IP ADDRESS LEARNING
IP ADDRESS LEARNING
(REGISTER ADDRESS TABLE)
·RECEIVING PORT ADDRESS
·SOURCE MAC ADDRESS
·SOURCE IP ADDRESS
·UPDATE TIMESTAMP
S02
END

FIG. 7

FLOW TABLE 9

PORT	MAC ADDRESS		IP ADDRESS		TIMESTAMP
	SOURCE	DESTINATION	SOURCE	DESTINATION	
1	MAC-R1	MAC-A	IP-B	IP-A	
2	MAC-R2	MAC-B	IP-A	IP-B	

FIG. 8

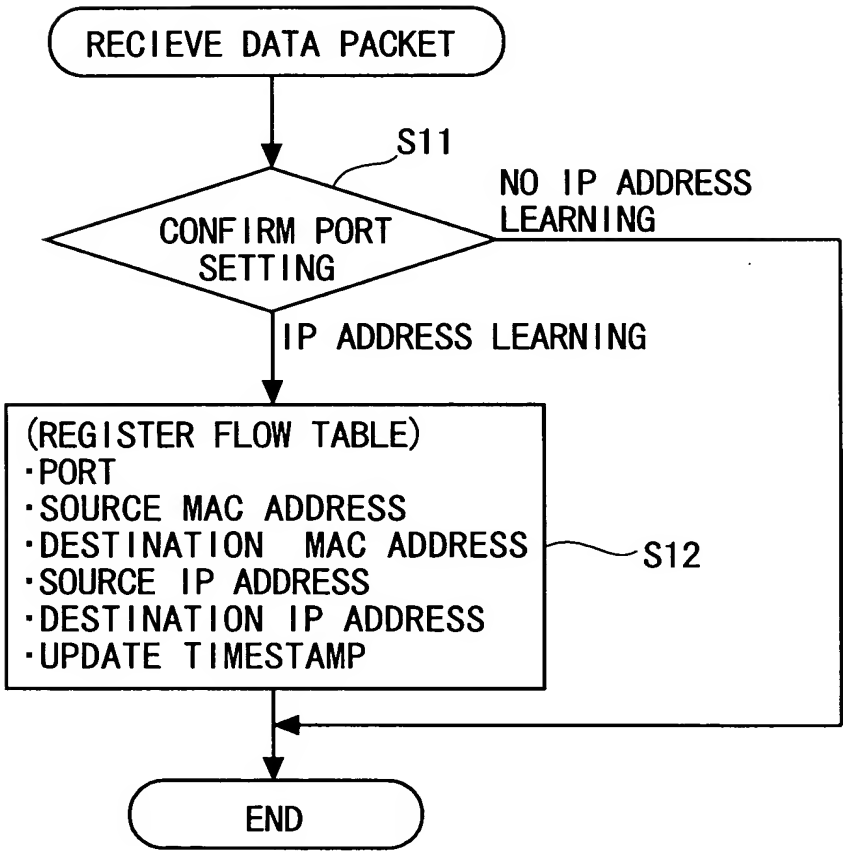
RECIEVE DATA PACKET
S11
CONFIRM PORT SETTING
NO IP ADDRESS LEARNING
IP ADDRESS LEARNING
(REGISTER FLOW TABLE)
·PORT
·SOURCE MAC ADDRESS
·DESTINATION MAC ADDRESS
·SOURCE IP ADDRESS
·DESTINATION IP ADDRESS
·UPDATE TIMESTAMP
S12
END

FIG. 9

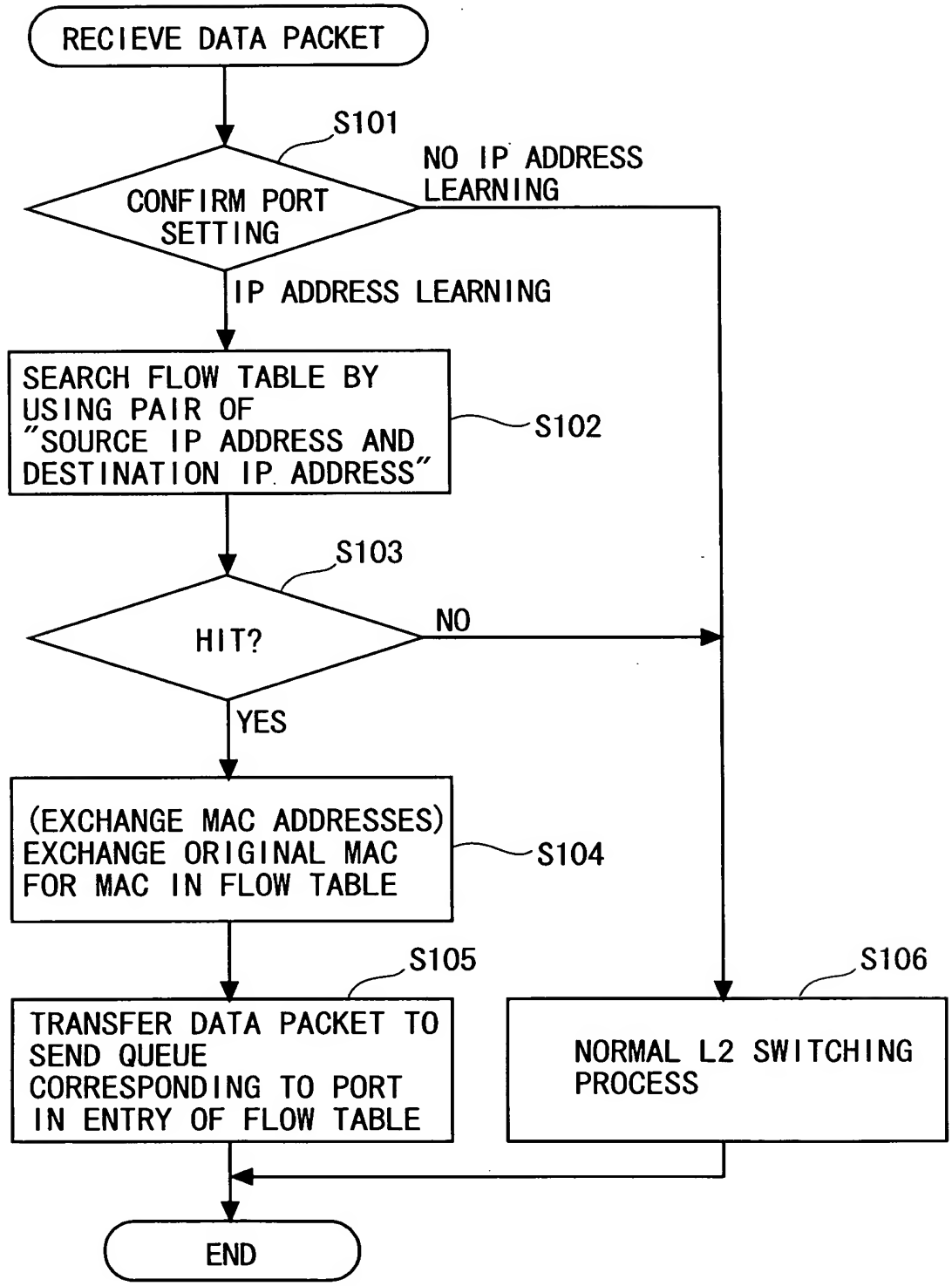
RECIEVE DATA PACKET
S101
CONFIRM PORT SETTING
NO IP ADDRESS LEARNING
IP ADDRESS LEARNING
SEARCH FLOW TABLE BY USING PAIR OF "SOURCE IP ADDRESS AND DESTINATION IP ADDRESS"
S102
S103
HIT?
NO
YES
(EXCHANGE MAC ADDRESSES) EXCHANGE ORIGINAL MAC FOR MAC IN FLOW TABLE
S104
S105
TRANSFER DATA PACKET TO SEND QUEUE CORRESPONDING TO PORT IN ENTRY OF FLOW TABLE
S106
NORMAL L2 SWITCHING PROCESS
END

FIG. 10

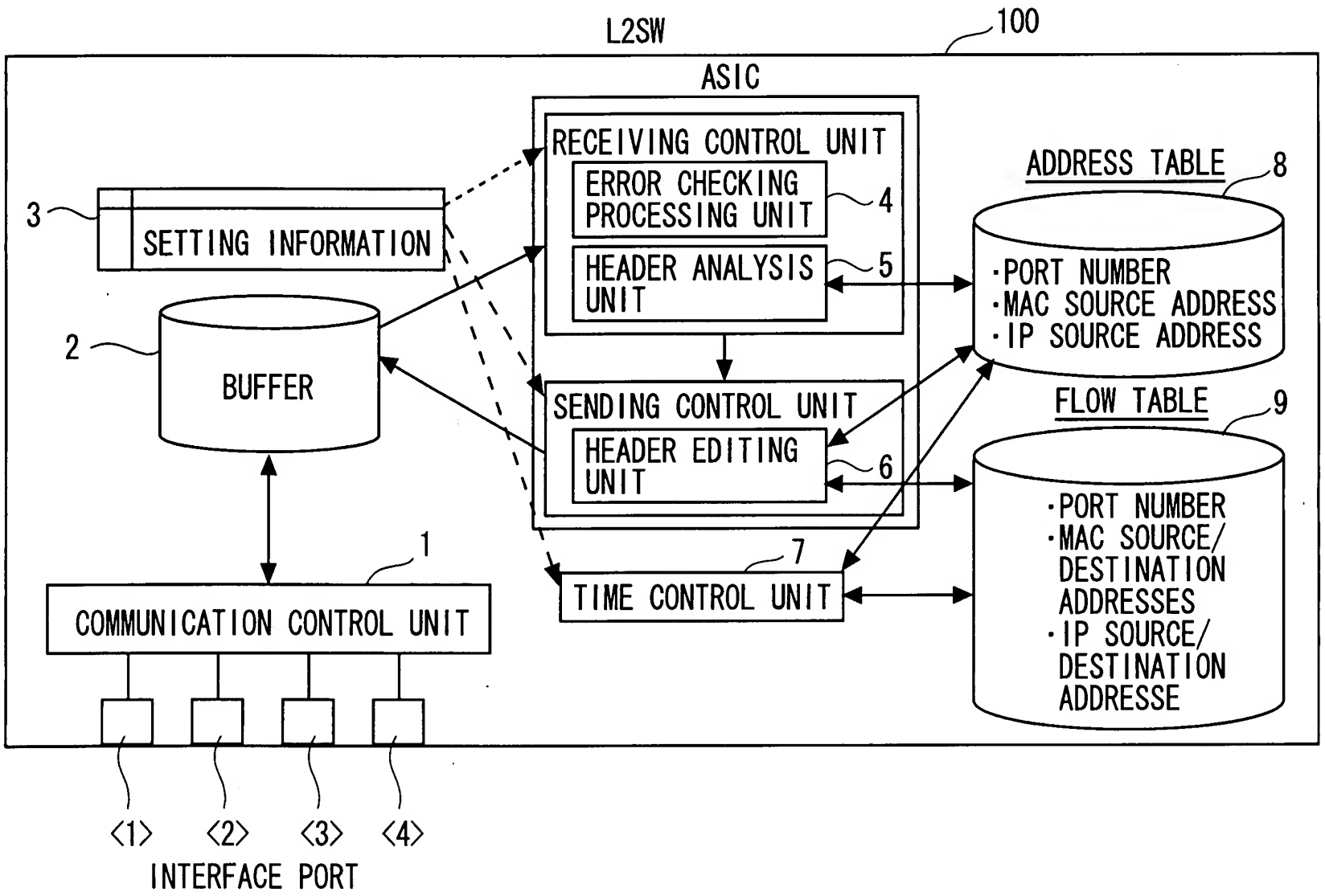
L2SW
100
ASIC
RECEIVING CONTROL UNIT
ERROR CHECKING PROCESSING UNIT
4
HEADER ANALYSIS UNIT
5
ADDRESS TABLE
8
·PORT NUMBER
·MAC SOURCE ADDRESS
·IP SOURCE ADDRESS
3
SETTING INFORMATION
2
BUFFER
SENDING CONTROL UNIT
HEADER EDITING UNIT
6
FLOW TABLE
9
·PORT NUMBER
·MAC SOURCE/ DESTINATION ADDRESSES
·IP SOURCE/ DESTINATION ADDRESSE
1
7
TIME CONTROL UNIT
COMMUNICATION CONTROL UNIT
<1>
<2>
<3>
<4>
INTERFACE PORT

FIG. 11

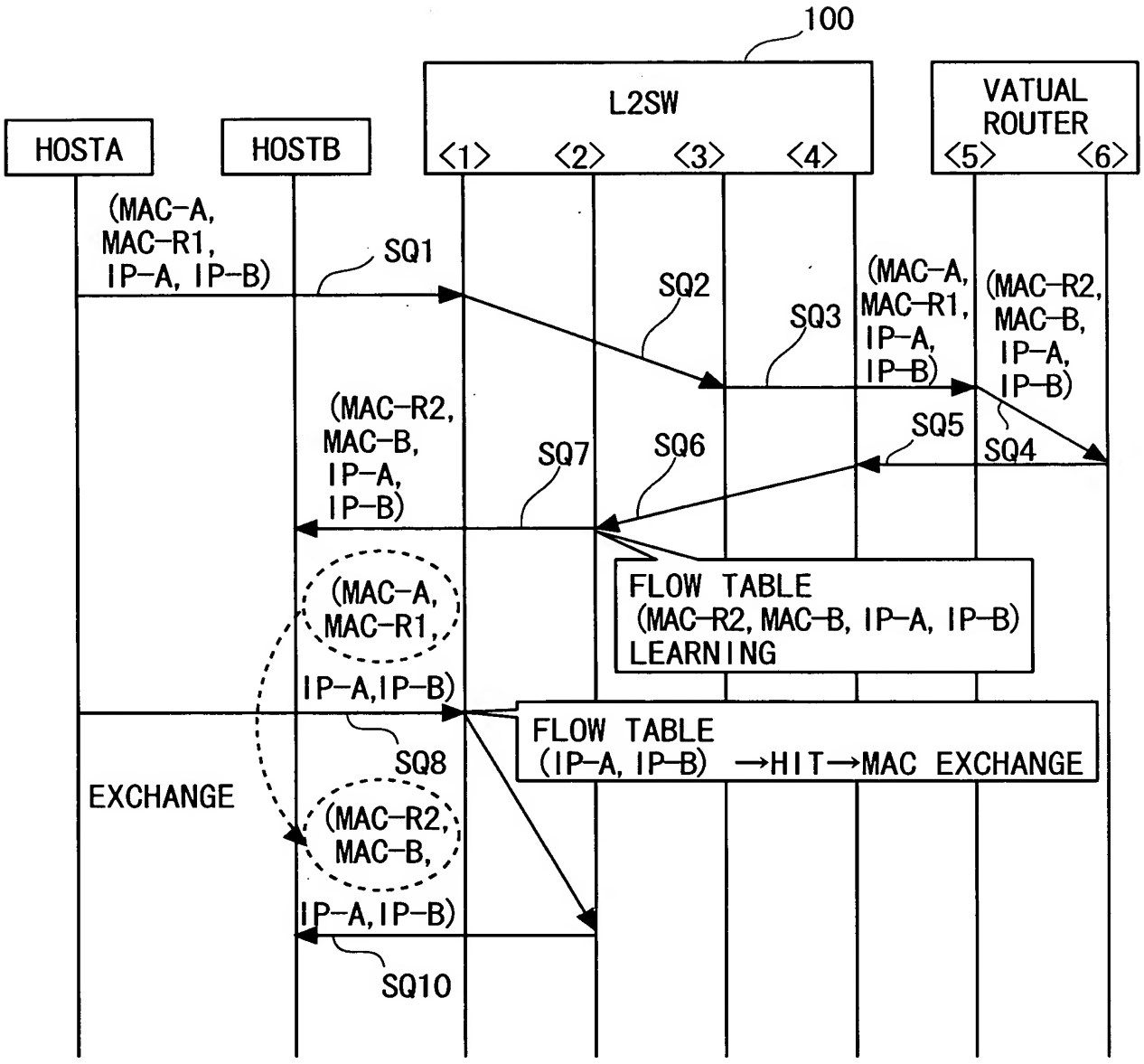
100
L2SW
VATUAL ROUTER
HOSTA
HOSTB
<1>
<2>
<3>
<4>
<5>
<6>
(MAC-A, MAC-R1, IP-A, IP-B)
SQ1
SQ2
SQ3
(MAC-A, MAC-R1, IP-A, IP-B)
(MAC-R2, MAC-B, IP-A, IP-B)
SQ4
SQ5
SQ6
SQ7
(MAC-R2, MAC-B, IP-A, IP-B)
FLOW TABLE
(MAC-R2, MAC-B, IP-A, IP-B)
LEARNING
(MAC-A, MAC-R1, IP-A, IP-B)
SQ8
FLOW TABLE
(IP-A, IP-B) →HIT→MAC EXCHANGE
EXCHANGE
(MAC-R2, MAC-B, IP-A, IP-B)
SQ10

FIG. 12

PRIOR ART

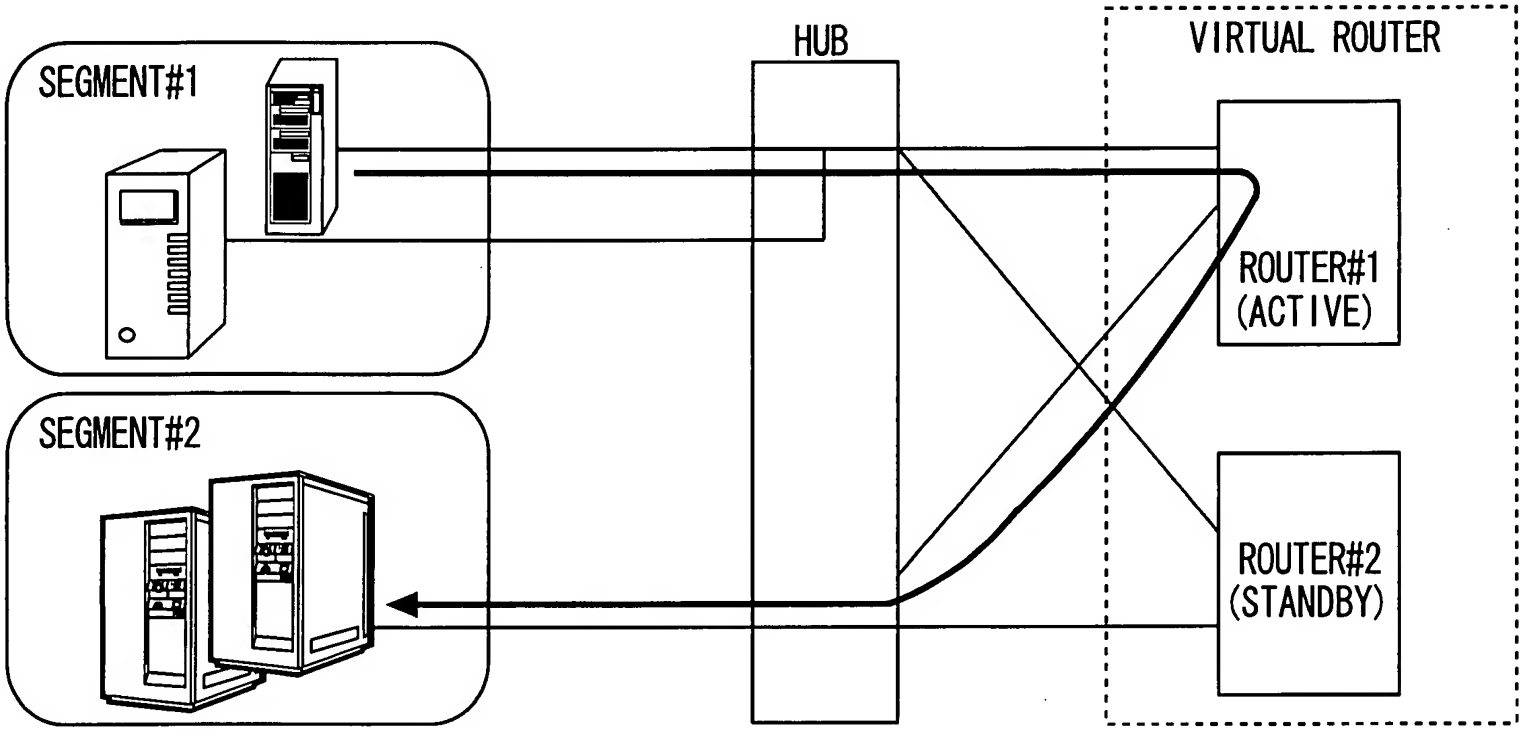

FIG. 13

PRIOR ART

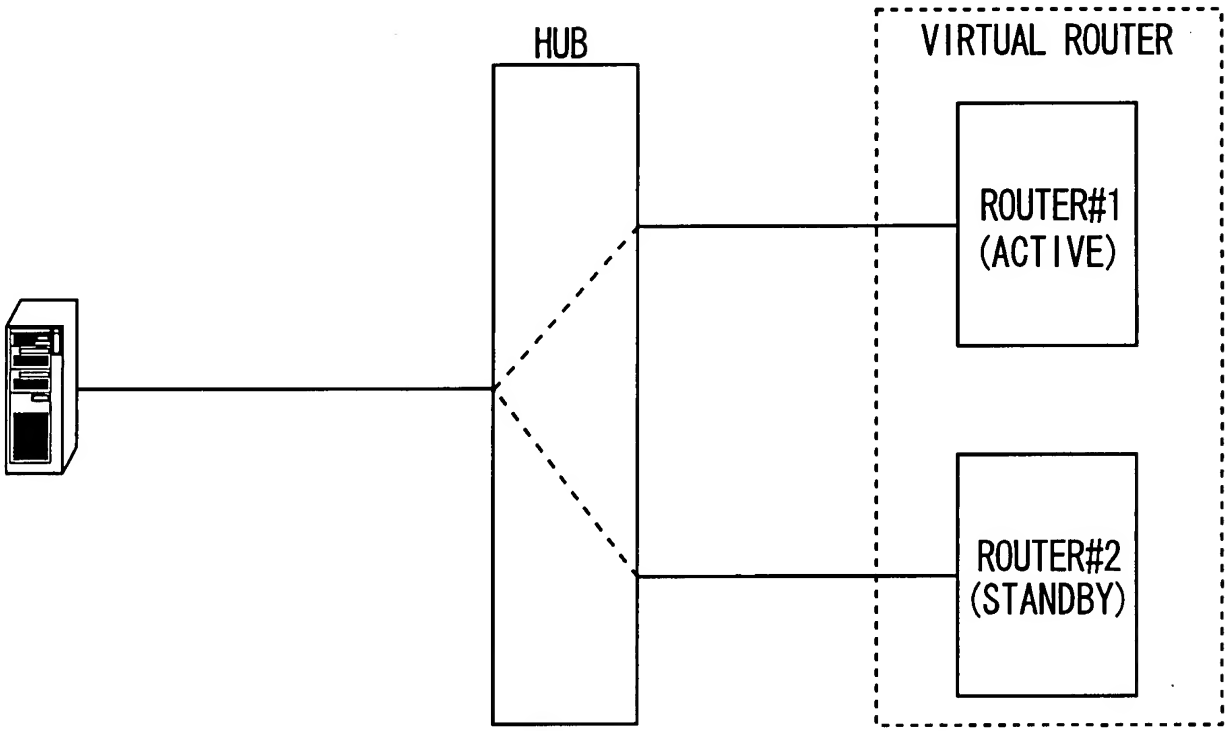

FIG. 14
PRIOR ART

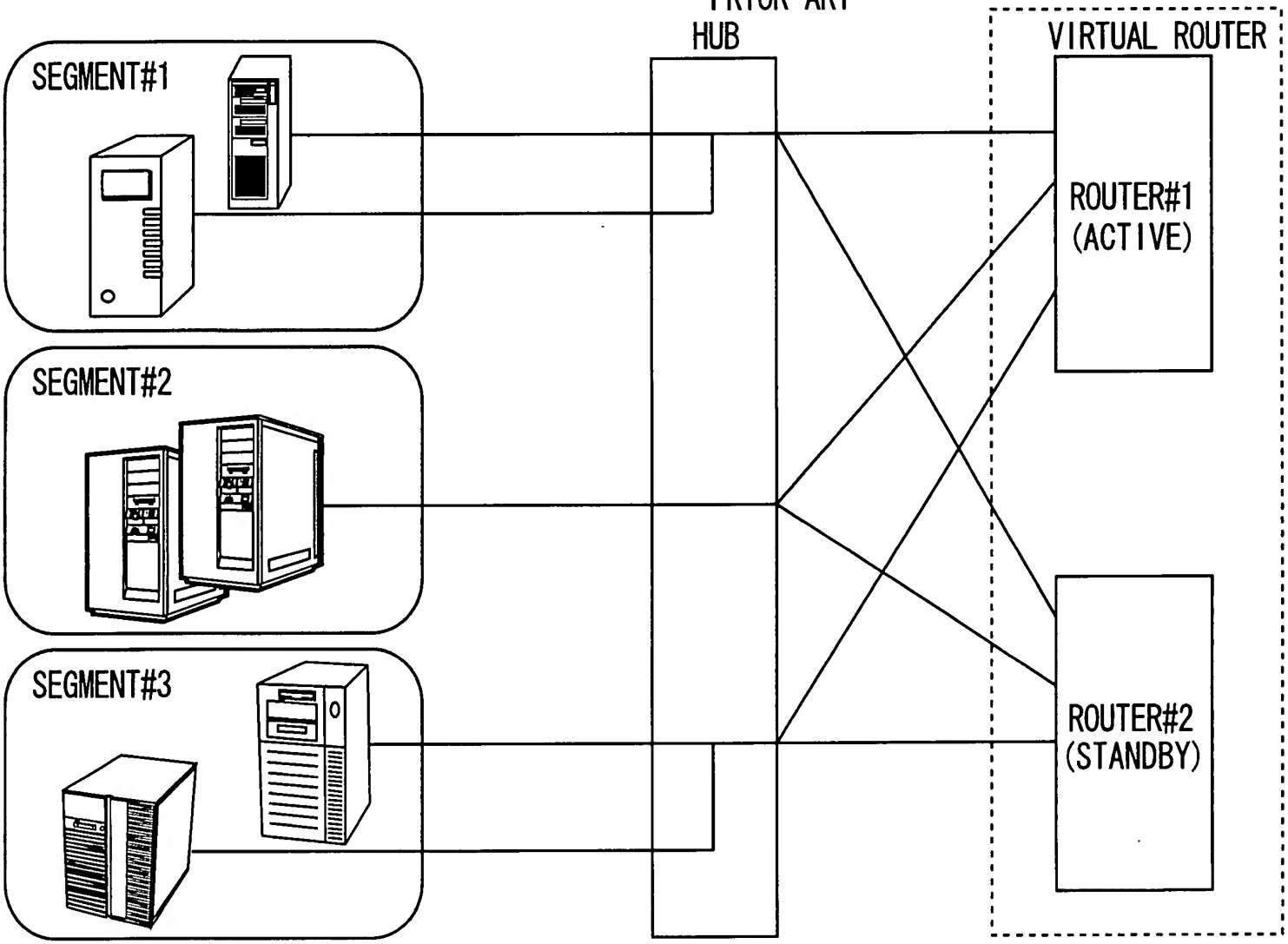

FIG. 15
PRIOR ART

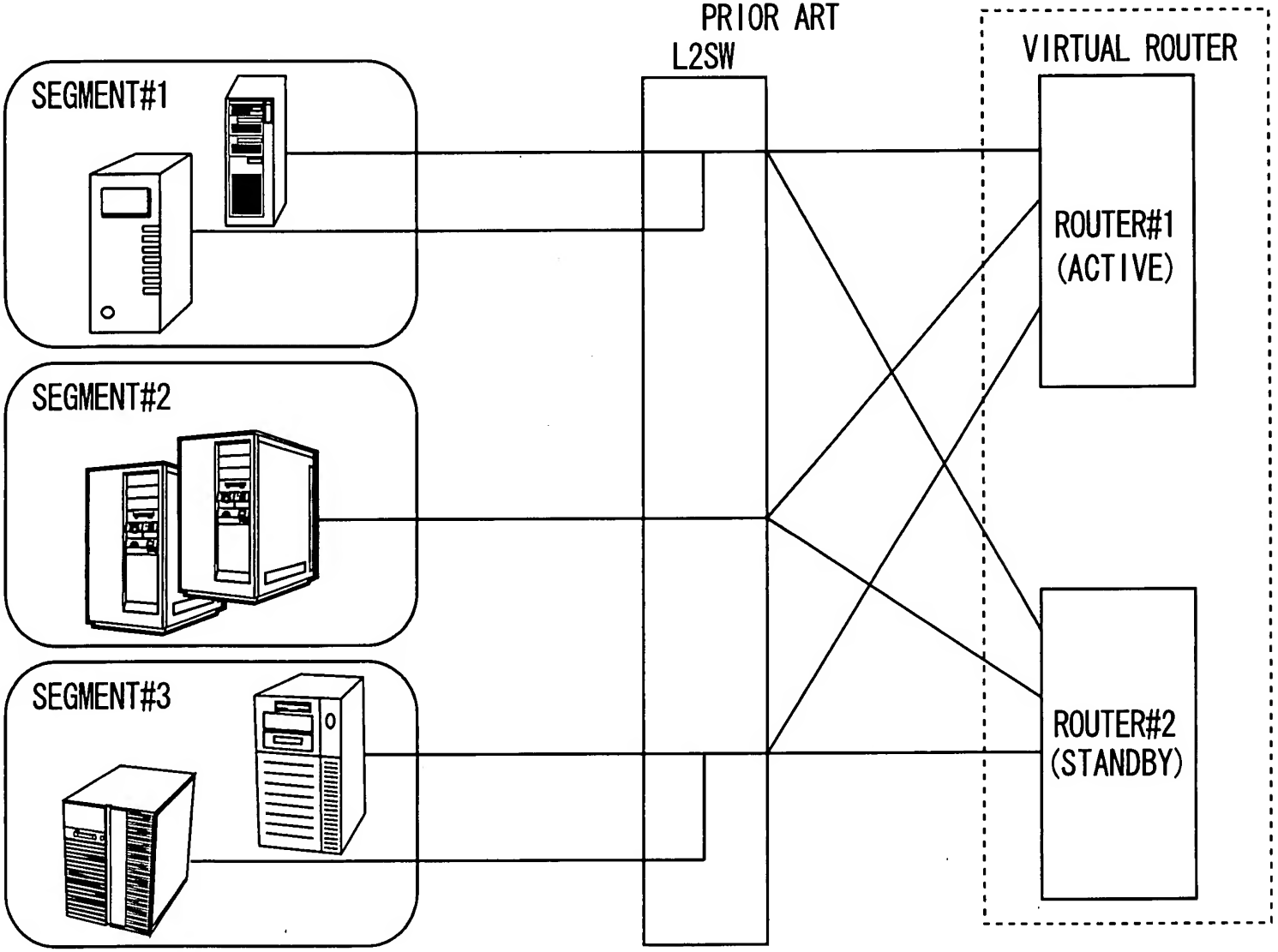

FIG. 16

PRIOR ART